

What is claimed is:

1. A data recording disk drive comprising:

a housing;

at least one disk rotatable about an axis of rotation;

a motor attached to the housing for rotating the disk;

a plate fixed to the housing, the plate extending circumferentially around a sector of the disk and radially across a radially outer annular region of the disk, the plate having a surface facing a disk surface, the axial spacing between the plate's surface and the disk's surface varying along the radial extent of the plate.
2. The disk drive of claim 1 wherein there is only one disk, wherein the housing includes a base, the motor and disk being mounted on the base, and wherein the plate is part of the base, whereby the base has a surface facing the bottom surface of the disk.
3. The disk drive of claim 1 wherein there is only one disk, wherein the housing includes a base, the motor and disk being mounted on the base, and wherein the plate is part of the cover, whereby the cover has a surface facing the top surface of the disk

4. A data recording disk drive comprising:

a housing;

a rotatable stack of disks axially spaced along a common axis of rotation;

a motor attached to the housing for rotating the disk stack;

a plate fixed to the housing and located between two axially adjacent disks, the plate extending circumferentially around a sector of the two disks and radially across a radially outer annular region of the two disks, the plate having a first surface facing a surface of a first disk and a second surface facing a surface of the second disk, the axial spacing between the plate's first surface and the surface of the first disk varying along the radial extent of the plate.

5. The disk drive of claim 4 further comprising a plurality of plates, each plate being located between a different set of two axially adjacent disks.

6. The disk drive of claim 4 wherein at least one of the first and second surfaces of the plate comprises a plurality of radially-spaced concentric grooves, the grooves defining radially-spaced ribs.

7. The disk drive of claim 6 wherein the grooves are equally radially-spaced.

8. The disk drive of claim 7 wherein the ratio of the radial width of a groove to the radial width of a rib is between approximately 1:4 and 4:1.
9. The disk drive of claim 4 wherein at least one of the first and second surfaces of the plate comprises a plurality of discrete surface features.
10. The disk drive of claim 9 wherein the surface features are dimples.
11. The disk drive of claim 10 wherein the dimples are formed in a pattern of radially-spaced concentric dimples.
12. The disk drive of claim 9 wherein the surface features are bumps.
13. The disk drive of claim 12 wherein the bumps are formed in a pattern of radially-spaced concentric bumps.
14. The disk drive of claim 4 wherein at least one of the first and second surfaces of the plate is a section of a conical surface, whereby said axial spacing varies linearly along the radial extent of the plate.

15. A magnetic recording disk drive comprising:
a housing;
a rotatable stack of N hard disks axially spaced along a common axis of rotation,
where N is greater than 1, each of the disks having a substantially planar surface;
a motor attached to the housing for rotating the disk stack;
N-1 plates fixed to the housing, each plate located between a unique set of two
axially adjacent disks, each plate extending circumferentially around a sector of its two
associated disks and radially across a radially outer annular region of its two associated
disks, each plate having a first substantially nonplanar surface facing a substantially planar
surface of a first disk in its set and a second nonplanar surface facing a substantially planar
surface of the second disk in its set.

16. The disk drive of claim 15 wherein each of the first and second surfaces of
each plate comprises a plurality of radially-spaced concentric grooves, the grooves defining
radially-spaced ribs.

17. The disk drive of claim 16 wherein the grooves are equally radially-spaced.

18. The disk drive of claim 17 wherein the ratio of the radial width of a groove to
the radial width of a rib is between approximately 1:4 and 4:1.

19. The disk drive of claim 15 wherein each of the first and second surfaces of each plate comprises a plurality of surface features.

20. The disk drive of claim 19 wherein the surface features are dimples.

21. The disk drive of claim 20 wherein the dimples are formed in a pattern of radially-spaced concentric dimples.

22. The disk drive of claim 19 wherein the surface features are bumps.

23. The disk drive of claim 22 wherein the bumps are formed in a pattern of radially-spaced concentric bumps.

24. The disk drive of claim 15 wherein each of the first and second surfaces of each plate is a section of a conical surface, whereby said axial spacing varies linearly along the radial extent of the plate.